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Tooth Decay

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Tooth decay is the gradual destruction of a tooth. Decay begins when acids produced by bacteria in the mouth dissolve the hard surface (outer layer) of the tooth. A cavity is a specific site of tooth decay.

Cavities may start on the tooth's surface above the gum line (in the enamel). These cavities are called coronal cavities. Or they may start on the surface below the gum line (in the cementum). These cavities are called root surface cavities.

Decay can extend into a tooth's interior, which consists of the dentin and pulp. The pulp contains the nerve, artery, and vein of each tooth. If decay extends into the pulp, an infection may develop in the tooth and in nearby gum (gingiva) and bone. A collection of pus (abscess) may form. Rarely, the infection can spread through the bloodstream to other parts of the body.

Cavities can develop in people of all ages. Older people are especially likely to have root surface cavities and decay at or near the edge of a restoration, such as a filling or a crown.



See the figure [Without](#) and [With Cavities](#).

People get two chances with their teeth. During childhood, they learn how to care for 20 baby (deciduous) teeth. The risk of not caring for baby teeth is offset by the reassuring awareness that these teeth will be replaced. The second set, the permanent teeth, is for keeps. They must last for the rest of a person's life. Aging itself does little to interfere with the ability to keep permanent teeth in good repair.

Causes

Bacteria that produce acid cause tooth decay. When brushing and flossing (called oral hygiene) are not done well or not done at all, food debris is left in the mouth. Bacteria thrive on this debris. Food debris, mixed with saliva and dead cells from the inside of the mouth, is deposited in a soft thin film on teeth every day. This deposit is called dental plaque. The bacteria that cause decay accumulate in plaque. When plaque remains on teeth, it can harden to form tartar. Tartar cannot be removed with a toothbrush, so it must be removed by a dentist or dental hygienist. Plaque builds up mainly when oral hygiene is poor. Poor oral hygiene is especially common among older people. It may be poor because a person sees less well, hands are less agile, arms are less flexible and less easy to move, or memory is less reliable.

Having a dry mouth increases the risk of tooth decay. The risk is higher because saliva contains substances that kill certain microorganisms. Saliva also helps wash away food debris. As people age, the mouth may produce slightly less saliva and so may become drier. Dry mouth may also be caused by a disorder or the use of certain drugs. Disorders and certain drugs can change the mouth in ways that make it easier for the bacteria that cause tooth decay to grow. For example, disorders or drugs can change the acidity (pH) of the mouth.

Older people tend to have many restorations, such as fillings or crowns. After many years of use, restorations are more likely to break down, leaving small gaps at the edges. These gaps provide ideal spots for bacteria to accumulate and for decay to begin.

As people age, the enamel on teeth may wear away, the bone that supports teeth may be lost, and gums may recede around and between teeth. Receding gums may result from inflammation and infection of the gums (gingivitis) or of the ligaments and bones that support and anchor the teeth (periodontitis). Receding gums leave spaces (pockets) between gum and tooth where food debris can be trapped. The roots of affected teeth may be exposed to bacteria. Then, root surface cavities are more likely to develop.

Symptoms and Diagnosis

Tooth decay progresses slowly and produces few or no symptoms at first. Thus, it sneaks up on many older people. Tooth decay may be visible as discolored areas on the surface of teeth. These areas range from light brown to black. They can be as small as the head of a pin or as large as the entire tooth. If tooth decay reaches the pulp, it often causes pain. If the pulp is destroyed, pain may stop temporarily. However, if infection develops and results in a collection of pus (abscess), pain is likely to return, especially when food is chewed or the tooth is touched.

Swelling may develop around the tooth's root or even in the face or neck. Swelling may indicate that the infection has spread into the jawbone, face, or neck.

Tooth decay is suspected when a dentist or doctor notices a dark brown or black area on a tooth. The diagnosis is confirmed when a dentist closely inspects and probes the surface of the tooth. Dental x-rays can help confirm the diagnosis.

Prevention

People never outlive the need for regular dental examinations. Examinations every 4 to 6 months are recommended. They usually include removing plaque followed by polishing the teeth with fluoride (the entire procedure is called prophylaxis). Sometimes people who cannot get to a dentist's office (whether they live at home or in a long-term care facility) can arrange for a dentist to come to them.

Using a toothbrush and fluoride toothpaste every day can help prevent tooth decay. Brushing after each meal is best. When brushing cannot be done immediately after a meal, rinsing the mouth with a fluoride rinse or even water or chewing sugarless gum helps remove food debris. Brushing cannot remove all the food debris and plaque between teeth. So people should floss their teeth every day as a part of their oral hygiene regimen. Between-the-teeth (proxy) brushes can be very helpful, particularly for people with receding gums or gaps between the teeth where plaque can accumulate.

If use of the arms or hands is limited because of disorders such as arthritis, stroke, or Parkinson's disease, people may have difficulty brushing. Several gadgets can help. Toothpaste squeezers can be used to get toothpaste out of a tube. Extenders or holders can help people hold and manipulate a toothbrush. Electric and ultrasonic toothbrushes can be especially helpful. If holding onto a piece of dental floss is awkward, a floss holder can help. Or people can tie the ends of a piece of floss together to make a loop, which is easier to hold onto. If flossing is impossible, a device that uses water pressure to help remove debris from between teeth and from pockets around teeth is available.

If people cannot open their mouth very wide, brushing is harder. Such people should not force their mouth to open completely. Instead, they can use a toothbrush with a long, flexible handle and a small head (even a children's toothbrush) to brush the teeth as well as possible.

People with dementia often need to be reminded to brush or use a rinse. Some people with dementia need to have their teeth brushed by a caregiver. Most people with dementia need a

caregiver to make sure that they see a dentist regularly.

Treatment

When cavities develop, a dentist removes decayed areas of the tooth, usually with a drill. If the decay is limited to the enamel, the tooth can sometimes repair itself. Then all that is needed are prescription fluoride rinses, which help with repair. Fluoride makes the teeth more resistant to the acid produced by bacteria.

If decay is more extensive, the dentist prepares the surface of the tooth and fills the space left after removing decayed areas. New tooth-colored filling materials (composite resins and bonding agents) can sometimes be used. They help prevent cavities and appear natural. If a large area of the tooth is removed, a metal or porcelain crown may be needed. A crown fits over the whole tooth above the gum line. It is cemented securely in place.

Fillings and crowns are restorations. They help protect the remaining healthy part of the tooth and restore the tooth as much as possible to its original condition. If decay has damaged the pulp, root canal treatment is done. The pulp is removed, and the remaining space is filled with a substance that helps permanently prevent bacteria from entering that space. The tooth is then reshaped and covered with a metal or porcelain crown. If the tooth has so much decay that it cannot be restored or if other dental or medical problems make saving the tooth impossible, it may be removed (extracted).

Outlook

Treatment of tooth decay can almost always preserve the function and appearance of the tooth. Restorations can last many years. They are likely to last much longer if people brush and floss regularly and thoroughly and have regular dental checkups.